TRANSLATOR'S STATEMENT

Assistant Commissioner for Patents,
Washington, D.C.

Sir:

I, Sigrid Sommerfeldt, hereby certify:

That I am thoroughly familiar with the German and English languages; and

That I am competent to serve as a translator of German documents into English;

That the attached document represents a true English translation of International application PCT/EP2003/013309, filed November 26, 2003.

Signed this 25th day of November, 2005.

Sigrid Sommerfeldt
Translator

Spinneret Plate

The invention relates to a spinneret plate for producing melt-spun fibers for the production of geotextiles

Geotextiles are employed in many fields of technology, in particular for reinforcing embankments, slopes, as a base for concrete or asphalt surfaces, such as streets, airports, roads, bridges and the like, and specifically for new constructions as well as for redevelopments. Special requirements are made of the stability, strength and the water permeability of the geotextiles depending on the specific field of application.

Depending on the required property, until now fibers and filaments of different defined textures have been produced and solidified in the production of geotextiles. The finer the fibers or filaments, the stronger, and more stable is the geotextile after the solidification; the coarser the fibers or filaments, the higher is the water permeability of the geotextile. Optionally separately produced finer fibers are added before the solidification of a geotextile in order to attain the corresponding strength and stability.

The invention addresses the problem of providing a method and a device for the production of geotextiles comprised of fibers or filaments of different textures, in which the mixing or the adjusting of the fiber mixture does not laboriously take place after the production of the fibers and filaments, but rather already during the production of the fibers or filaments.

Subject matter of the invention is therefore a method for the production of geotextiles, characterized in that the production of continuous fibers of different texture takes place in one spinning process, whereby the adjustment of the ratio of fibers of finer and coarser texture is defined and, in the subsequent mechanical and/or hydraulic solidification, a geotextile with defined properties is produced.

A further subject matter of the invention is a spinneret plate for the production of melt-spun continuous fibers for geotextiles, characterized in that the spinneret plate has bores of different

diameters for the production of fibers of different texture in one spinning process.

Through the proportion of finer fibers, the desired stability and strength of the finished geotextile can be adjusted. The proportion of coarser fibers determines the hydraulic properties of the finished geotextile, for example the water permeability in the nonwoven fabric plane or normal to the nonwoven fabric plane.

The higher the proportion of fine fibers, the stronger and more stable is the geotextile subsequently produced through mechanical and/or hydraulic solidification. The higher the proportion of coarser fibers, the higher is the water permeability of the geotextile after the mechanical and/or hydraulic solidification.

Possible starting materials for the fine as well as also for the coarser fibers are, for example, synthetic materials, such as polypropylene, polyethylene, polyamide or polyester.

By fine fibers, which serve for the mechanical and/or hydraulic solidification of the geotextile, are understood fibers having a texture of 1-10 dtex, preferably 1-7 dtex. As a function of the selected texture of the finer fibers, the coarser fibers have a texture of 6-30 dtex, preferably 7-27 dtex.

The textures of the fiber types preferably differ by a factor of 3 to 20, especially preferred by a factor of 4 to 6.

Depending on the desired properties, in particular on the desired combination of strength, stability and water permeability, and as a function of the selected textures, the proportion of fine fibers in the finished geotextile can be 20-95%, preferably 30-90%.

However, it is also possible to use more than two fibers of different texture. In this case, three or more fibers of different texture are utilized for the production of the geotextile, the selection of the textures, again, being dependent on the desired properties of the finished geotextile.

The fibers of different texture are produced in one spinning process utilizing the spinneret plate according to the invention. The fibers are subsequently laid down in the conventional manner and mechanically and/or hydraulically, chemically and/or thermally solidified.

For the production of a defined mixture of fibers or filaments of different texture, a spinneret plate with differently defined bores is utilized and thereby the mixing ratio of fibers and their texture is already defined during the production of the fibers.

This spinneret plate according to the invention has bores with different capillary diameters for the simultaneous production of continuous fibers of different texture.

The capillary diameters of the bores are so dimensioned that the fibers of different texture can be produced simultaneously in the desired ratio.

The bores can therein be distributed at regular intervals as well as also randomly.

Depending on the desired cross section of the fiber, the capillary bores may have suitable shapes (trilobal, octalobal, star-shaped, hollow, triangular, triangular hollow, etc.) wherein the cross sections of the fine and the coarser fibers, or optionally of further utilized fibers, may also be different.

Example 1

Standard Geotextile

Starting material (granulate)	Polypropylene
Proportion of fine filaments, %	100
Filament titer, dtex	4
Proportion of coarse filaments, %	0
Filament titer, dtex	-
Weight/unit area, g/m^2	250
Wide width tensile strength EN ISO 10319, kN/m	
Longitudinal	19.1
Transverse	19.4
Water permeability in the geotextile plane EN ISO 12958 20 kPa, i=1, [l/m/s]	$3.0 \cdot 10^{-3}$
Water permeability normal to the plane EN ISO 11058 VI_{H50} [m/s]	$5.1 \cdot 10^{-2}$

Example 2

Starting material (granulate)	Polypropylene
Proportion of fine filaments, %	90
Filament titer, dtex	4
Proportion of coarse filaments, %	10
Filament titer, dtex	18
Weight/unit area, g/m^2	250
Wide width tensile strength EN ISO 10319, kN/m	
Longitudinal	18.8
Transverse	19.0
Water permeability in the geotextile plane EN ISO 12958 20 kPa, i=1, [l/ms/s]	$8.2 \cdot 10^{-3}$
Water permeability normal to the plane EN ISO 11058 VI_{H50} [m/s]	$8.4 \cdot 10^{-2}$

Example 3

Starting material (granulate)	Polypropylene
Proportion of fine filaments, %	70
Filament titer, dtex	3
Proportion of coarse filaments, %	30
Filament titer, dtex	15
Weight/unit area, g/m^2	250
Wide width tensile strength EN ISO 10319, kN/m	
Longitudinal	18.5
Transverse	18.7
Water permeability in the geotextile plane EN ISO 12958 20 kPa, i=1, [l/ms/s]	$1.1 \cdot 10^{-2}$
Water permeability normal to the plane EN ISO 11058 VI_{H50} [m/s]	$1.2 \cdot 10^{-1}$